to any desired amount whilst the machine is running. That is, that when the machine has warmed up, the clearance can safely be made smaller. The radial clearances between the shrouding and the surface of the cylinder and shaft are made of the order of *-fa* to J- in. or even more in large machines.

When a turbine is on load and has got heated up, the shaft expands longitudinally rather more than the cylinder, and since the thrust bearing collar at the high-pressure end may be looked upon as the point of tie between

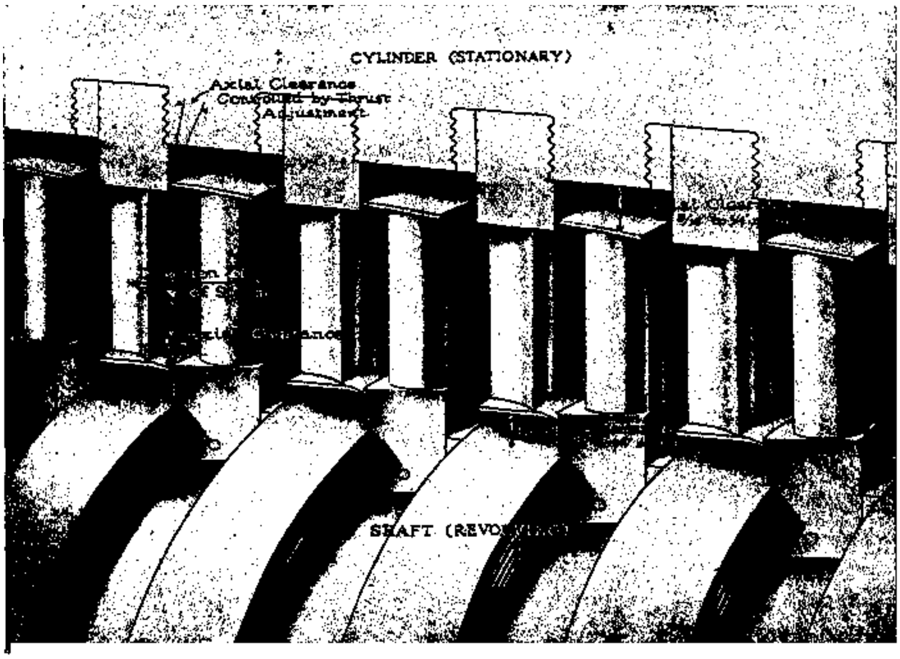

Fig. 12.—Parsons " End-tightened " Blading in Cylinder and Shaft, showing large Radial and Axial Clearance

the two, or the point of origin of the differential expansion, it will be realized that the tendency is for the axial working clearances to increase towards the exhaust end of the turbine, and hence the possibility of the binding together of the shrouds is to a certain extent obviated. Furthermore, the value of the end-tightened blading is greater at the high-pressure end where the steam leakage would be most serious. Thus larger radial clearances are obtained without increasing steam leakage, and greater steam economy can be realized with this type of blading than with the older forms.

The earliest designs of Parsons turbines had axial adjustment on working clearances in the dummy or balancing pistons and in the labyrinth glands.

The same principle has been used with the end-tightened blading. All these axial working clearances are adjusted simultaneously. The position of the shaft referred to the cylinder is fixed by means of the thrust bearing.

This thrust bearing, of the adjustable pivoted type, is shown in longi-